genus of fishes give birth to their young alive. An incision made in the abdomen of the one under consideration established the fact; for three young ones were found within it, and all of them in different stages of development. The first we removed was fully developed in all its parts, but still had the placenta attached to its belly, but altogether detached from the parent, and evidently in condition to be discharged from the parent in a couple of days. The second was intermediate in its development to the one just described and the third. In the latter the abdominal suture was not yet closed, neither was the black transverse band which divides into two parts the cornea and iris of the eyes of this genus (which band was perfect in the first-mentioned young one, and not entirely perfect in the second) at all developed. I think this observation fully establishes the entirely viviparous (not ovo-viviparous as most writers have it) nature of the genus. Does not also the singular fact of the young being found in intermediate stages of development within the parent present a strange anomaly in the history of viviparous reproduction—an undeniable argument against the generally accepted opinion of the laws which are supposed to govern the reproduction of species in animal life? Of the above fact I desire no further evidence. Whether it is of that importance to the scientific world which my imperfect relation above would imply, I leave for others, more deeply versed in such investigations, to decide."

The following papers were read :—

1. Notes on a Collection of Bats made by Mr. Andersson in the Damara Country, South-western Africa, with Notices of some other African Species. By Robert F. Tomes, Corr. Memb. Zool. Soc.

Through the kindness of J. H. Gurney, Esq., M.P., I have been enabled to examine a very interesting, though not very extensive, collection of Bats, made by Mr. Andersson in South-western Africa during the year 1859. It contains three new species; and I propose, when describing them, to add notices of some others previously collected by Mr. Andersson at Lake Ngama, and of one or two species which, although already well known, may, from their affinity with some of those in the present collection, be advantageously introduced here. To prevent any confusion regarding the species forming the collection recently received from Mr. Andersson, they may be mentioned here, as follows:—*Kerivoula argentata*, n. s., *Nycticejus planirostris*, Peters, *Scotophilus minutus*, Temm., *S. rusticus*, n. s., and *S. variegatus*, n. s.

The remaining species mentioned in this paper are—*Scotophilus capensis*, from the Cape of Good Hope, collected by M. Verreaux, *Miniopteris schreibersii* and *Molossus limbatus*, both collected by Mr. Andersson at Lake Ngama, and *Scotophilus kuhlii*, collected in Algeria by the Rev. H. B. Tristram.

KERIVOULA ARGENTATA, n. s.

In the Proceedings of this Society for 1858 I described at some length the peculiarities of the present group of Bats, giving my reasons for regarding these peculiarities as generic. All that was stated respecting the several species then enumerated may with equal exactness be said of the present one; and I may add that I have since that time again examined the fine collection of Bats in the Leyden Museum, and that, with the exception of identifying my specimens of *K. papillosa* with the *Vespertilio papillosus* of M. Temminck, and examining a specimen of my *K. ærosa*, labelled "Gorontalo," I saw nothing which in any way either confirmed or modified my previous opinions of the genus.

The present species is of larger size than either of the African species before described, fully equal in size to the *K. papillosa*, and in the colour of its fur it differs from all the other species.

Compared with the African species which it most nearly resembles, it possesses some of the characters of both *K. lanosa* and *K. ærosa*.

The top of the head is elevated in about the same degree as in *K. ærosa*; and it greatly resembles this species in the shape of the muzzle and the distribution of the hair on the face; but in the shape of the ears it approaches more nearly to *K. lanosa*, differing from it only in having the inner rounded margin toward the top of the ears more prominent even than in that species. The tragus is remarkably narrow, and tapers evenly to an exceedingly acute point; near the bottom of its outer edge is a narrow notch, or rather slit, and below it a small and pointed process, which is placed, in fact, immediately above what may be called the foot-stalk or narrow root of the tragus. Inside the ear, and vertically beneath the tragus, is a well-defined fleshy tubercle, of a flattened form, and about one line in length.

In the quantity and distribution of the fur on the membranes, this species is intermediate between *K. lanosa* and *K. ærosa*, but it has fewer adpressed hairs on the wings than either. The fur of the back extends on to the membranes of the flanks a little, and on to the interfemoral membrane in a scattered manner, but more thickly on to the tibiæ and feet, especially on to the latter, which are well clothed. Beneath, it extends a little on to the membranes near the sides of the body. The *os calcis* is well clothed with short adpressed hairs; and between it and the tail-tip the membrane is fringed with closely-set hairs, which curve downwards and have a comb-like appearance, as in *K. lanosa*.

The fur is everywhere long and silky; that of all the upper parts is of four colours—at the root very dark grey for a fourth of its length, then yellowish, passing into a pale but bright rust-colour, and the tips of the hairs of a shining and silvery white. There is very little variation in the colouring of the different parts of the upper surface. Beneath, the fur is unicoloured and dirty-white, on the sides of the neck and on the cheeks tinged with rust-colour.

The teeth, as far as may be gathered from inspection without re-

moving the skull from the specimen, are like those of *K. lanosa*, the upper incisors being, as in that species, nearly of the same length. The outer incisors in the lower jaw have the singular and prominent cusp, which I have mentioned as peculiar to the genus, quite as much developed as in any of the species.

	″	‴
Length of the head and body, about	2	0
——— of the head	0	8
——— of the ears	0	5
Breadth of the ears	0	$5\frac{1}{2}$
Length of the tragus	0	4
Greatest breadth of the tragus, barely	0	1
Length of the fore-arm	1	6
——— of the thumb and its claw	0	$4\frac{1}{2}$
——— of the first finger	1	6
——— of the second	3	6
——— of the third.....	2	6
——— of the fourth	2	4
——— of the tibia	0	$7\frac{1}{2}$
——— of the foot and claws	0	$4\frac{1}{2}$
——— of the *os calcis*	0	10
Expanse of wings, about	12	0

Hab. "Otjoro, December 1st, 1859. Female."

Nycticejus planirostris, Peters.

N. planirostris, Peters, Reise n. Mossamb. Säugeth. i. 65. t. 17. f. 1, 1852.

Of this species there are a considerable number of specimens, differing from each other only in the depth of colouring of the fur—some of them being as dark in colour as the figure given by Dr. Peters, but the greater number much paler, the under parts being of a dirty-white colour. These light-coloured examples have much the appearance of *N. leucogaster*, but may be distinguished by their more robust form, larger head and ears, and by their much longer fur. I possess one specimen of this species from the Cape of Good Hope.

Hab. "Eleph. Valley, August 3rd, 1859," and "Otjoro, December 1st, 1859."

Scotophilus minutus.

Vespertilio minuta, Temm. Mon. ii. p. 207.

Although M. Temminck refers to several specimens of this species, I have only observed one in the Leyden Museum; and that one is obviously immature. As there is considerable confusion amongst the species referred to this, I will give a description of an adult specimen which, by actual comparison, I have ascertained to be identical with the specimen in the Leyden Museum. The *S. minutus* appears to have a considerable geographical range; for I have seen and identified specimens from North Africa, as well as from the Cape; and examples are not wanting to illustrate its occurrence at intermediate

positions. I have two specimens which were collected by Mr. Andersson at Lake Ngama.

The top of the head is on the same plane with the face; the muzzle is moderately obtuse, a little more so than in the *S. kuhlii* of Europe; the nostrils are slightly tubular, ovoid, and opening sublaterally; between them is a shallow notch, which passes into a kind of narrow groove or canal, and is continued along the mesial line of the snout until it meets the fur of the forehead. The ears are considerably shorter than the head, triangular, rather longer than wide, a little rounded at the ends, and with scarcely a trace of external emargination or scooping out. There is no prolongation of the outer margin along the face anteriorly, to the root of the tragus. The tragus is about half the length of the ear; its greatest breadth is at one-third from the bottom, from which part it curves evenly to the tip, which is narrow and rounded; the inner edge is straight or a little concave, which gives the tragus somewhat of an inward tendency; in the outer margin, near to the base, is a notch, and below it a distinct but rounded lobe.

The thumb is small, its penultimate phalange the longest, its claw small and weak. The feet are rather small, the toes taking up more than half their length, the claws of medium size.

The wing-membranes extend to the root of the toes. The wings themselves are of medium size, and the membranes slightly translucent, but nowhere papillated.

The fur of the forehead extends to more than halfway between the root of the ear and the nostrils; sides of the face scattered with fine short hairs; over the eye a tuft of straight black hairs; and on the upper lip a straggling moustache of shorter and finer ones. The fur of the back extends on to the membrane beneath the humerus, and sparingly on to the interfemoral membrane; beneath, it encroaches on the membranes for a short distance all round the body.

On all the upper parts the fur is bicoloured, almost black at the roots for half its length, the remaining part of a dark brown colour, sometimes approaching an umber-brown, but more frequently dark greyish-brown. Beneath it is also bicoloured, brownish-black for two-thirds of its length, and tipped with whitish-brown; about the chin and sides of the neck it is tinged with chestnut, and on the pubes it is nearly cream-coloured. Cutaneous system dark brown, claws pale brown.

The cranium in its general outline very greatly resembles that of *S. kuhlii* and that of *S. pipistrellus*: but its similarity to the former of these is the most striking; to this species, indeed, it is rather closely allied, although perfectly distinct.

Dentition: M. $\frac{2-2}{6}$; Can. $\frac{1-1}{1-1}$; Premol. $\frac{1-1}{2-2}$; Mol. $\frac{3-3}{3-3}=\frac{14}{18}$.

The upper incisors are very unequal in size; the outer ones very small, and pointed; the inner ones twice the length of the outer ones, slender, and pointed, with an ill-defined second point, which is situated outwardly. The canines are rather slender, and have a regularly disposed cingulum. The premolar tooth is rather longer than the

molars, and has the usual *carnassial* form. The true molars require no special mention.

The incisors in the lower jaw are small, symmetrically arranged, and trilobed; the canines have an anterior process above the level of the incisors, and a posterior one quite at the base; the first premolar is small and conical, about one-third the length of the canines; the second similar in shape, but almost twice the length of the first. The true molars may be passed by.

This species is one of a small group which is confined almost wholly to Africa,—the only species which is found elsewhere, as far as I know at present, being the *S. kuhlii** of Europe; and it is likely that this species is more abundant in the former than in the latter country. I shall be enabled, by reference to this known species as here described, to give a more satisfactory account of some others. I propose giving the dimensions together.

Scotophilus rusticus, n. s.

The present diminutive species resembles in the shape of its head, ears, and incisor teeth the *S. kuhlii* and the *S. minutus*. Top of the head nearly on a level with the face, nostrils somewhat crescent-shaped, and the snout grooved as in *S. minutus*; ears small and triangular, as in *S. minutus*; tragus of uniform breadth, rounded at the end and curving inwards, the notch in its outer margin, at the base, small, and the lobe below it small and pointed. As in *S. minutus* the outer margin of the ear does not advance nearer the angle of the mouth than the base of the tragus.

Thumb and feet rather large in relation to the size of the animal, being equal in size to those of *S. minutus*. They are proportioned just as in that species.

The fur is confined to the body, both above and beneath. It is everywhere thick, soft, of moderate length, and without gloss. On the upper surface it is dark brown at the roots, with the terminal half light cinnamon-brown; on the under parts of the body, dusky at the roots, with the terminal half brownish white, excepting on the pubes, where it is almost of a uniform dirty white. The nose, ears, and wing-membranes are dark brown, the latter very narrowly edged with white, which is most distinct on each side of the feet.

The cranium resembles that of *S. kuhlii*, both in general conformation and in the number and arrangement of its teeth, being possessed of one more premolar than *S. minutus*.

Dentition: M. $\frac{2-2}{6}$; Can. $\frac{1-1}{1-1}$; Premol. $\frac{2-2}{2-2}$; Mol. $\frac{3-3}{3-3}=\frac{16}{18}$.

The upper incisors are unequal in size, just as in *S. minutus*; the canines are relatively stouter than in that species, which is due in some measure to a slight fullness, or rounded prominence, in the middle of the thin hinder edge of the tooth; the first premolar is very small, being a mere tubercle, and is placed between the contiguous canine and premolar, and is visible only from within; the

* Prof. Blasius states that this species and *S. marginatus* are identical; hence make use of the above name as having priority.

second resembles in shape the first and only one in *S. minutus*, which it represents. The true molars do not need mention; and the lower jaw with its teeth is so much like that of *S. minutus*, that it may in like manner be dismissed.

SCOTOPHILUS CAPENSIS.

Vespertilio capensis, Smith, South Afr. Journ. new series, v. p. 1, 1832.

V. minutus, Smith, Ill. Zool. S. Afr. 1848.

I possess a specimen of a Bat which formerly formed part of the Museum of the Zoological Society, and was labelled "*Vesp. capensis*, Cape of Good Hope, collected by Mons. Verreaux," and is most likely the one given in the Catalogue prepared by Mr. Waterhouse, as the specimen was received the year before the publication of the catalogue. It is obviously the same species as the one figured by Sir Andrew Smith under the name of *V. minutus*, which species it resembles so exactly in all respects save that of size, that I shall content myself with giving the dimensions with those of the two last species. The greater size of this one will be quite sufficient to distinguish it.

In the following table of dimensions, the column which gives those of *S. capensis* has been taken from the specimen from the Zoological Society. The first one of *S. minutus* is from a North African specimen in my own collection, which has been compared with the specimen in the Leyden Museum, and the second one from the latter specimen itself. The fourth column (*S. kuhlii*) from a specimen collected in Algeria by the Rev. H. B. Tristram; and the remaining two columns are devoted to the two specimens of the new species, which I have called *S. rusticus*.

	S. capensis.	*S. minutus.*		*S. kuhlii.*	*S. rusticus.*	
		1.	2.		1.	2.
	in. lin.	in. lin.	in. lin.	in. lin.	in. lin.	in. lin.
Length of the head and body	2 2	1 10	1 9	1 10	1 6	1 7
——— of the head.....	0 8	0 7	0 7	0 7	0 6½	0 6½
——— of the ears	0 5	0 3½	0 3	0 3½	0 3½	0 3¾
——— of the tragus	0 2¾	0 2	0 2	0 2¼	0 2	0 1¾
——— of the fore-arm	1 6	1 2½	1 2½	1 3	1 2	1 2
——— of the thumb	0 3½	0 2½	0 3	0 3	0 3	0 2¾
——— of the first finger ...	.....	1 0	.....	.....	1 1	1 1
——— of the second finger..	2 8½	2 3	2 1	2 3	2 0	2 0
——— of the third finger ...	2 3	2 0	.....	1 10	1 9	1 8
——— of the fourth finger...	2 0	1 9	1 7	1 7	1 5	1 5
——— of the tibia	0 7	0 5½	0 5¾	0 5½	0 4½	0 5
——— of the foot and claws	0 4	0 3	0 3¼	0 3	0 3	0 2¾
——— of the tail	.....	1 5	1 3	1 4	1 2	
——— of the *os calcis*	0 6	0 6	.....	0 5½	0 5	0 5
Expanse of wings	11 0	9 3	8 6	9 4	7 8	8 0
Total length of skull	.....	.....	.....	0 6	.....	0 5½

SCOTOPHILUS VARIEGATUS, n. s.

This handsome species is about the size of the *S. leisleri* of Europe.

The head is very short; the muzzle short and obtuse, but not very broad or depressed, being about as deep as it is wide. The forehead is elevated in only a trifling degree above the facial line; the nostrils are somewhat prominent, rather small, and open sublaterally, almost laterally; they are nearly round, with a narrow posterior elongation or slit not exceeding in length the diameter of the nostril; the lips are simple, thick, and rather overhanging. The ears are small, of an irregular roundish ovoid form, their inner margin having a kind of lobe, the lower outline of which projects downwards over the forehead, and is there distinct; but blends off in an upward and outward direction to the tip of the ear, which is rounded, and has a somewhat outward direction; the outer margin approaches in some degree to a straight line, and a very narrow piece of membrane passes forward along the side of the head to near the corner of the mouth, where it terminates in a small fleshy lobulus of a rounded form. The ear-conch is rather thin, but not papillated, and has a few distinct sulci near its outer margin, and a longitudinal seam near the inner one. The tragus is broad and short, and shaped somewhat like that of the *S. borealis* of Europe. Outwardly at its base is a descending point, and above this a broad notch, which varies in depth, but is usually rather shallow; and above this it is of nearly equal breadth, the outer margin being rounded, and forming with the inner margin, which is nearly straight, a blunt angular tip, which is directed inwards.

The penultimate phalange of the thumb is a little longer than the basal one, the claw short and not very hooked. Toes rather longer than the remaining part of the foot; the claws small and black. Wing-membranes extending barely to the roots of the toes. Calcaneum long, with a considerable cartilaginous lobe near the middle of its lower edge.

The fur of the forehead extends almost to the end of the nose, in some specimens quite as far forward as the nostrils; the sides of the face sprinkled rather thickly with fine, short, whitish hairs; over the eye and between it and the nostrils are some longish black ones, which are straight and stiff. Inside the ears are a few fine adpressed hairs; and their outer surface is thickly clothed with fine fur for half-way from their base. The fur of the back extends on to the membranes on all parts, but to a greater extent on the interfemoral membrane than anywhere else. Beneath, it spreads on to the membranes, chiefly on and under the humerus, occupying the space (but not thickly) between the elbow and the knee. On their upper surfaces the toes are clothed with fine adpressed hairs; but the other parts of the foot are perfectly naked.

On all parts of the body the fur is long, soft, and unicoloured, or very nearly so; that of the upper parts cream-coloured, palest on the head and neck, and becoming considerably darker on the hinder part of the back and on the interfemoral membrane; beneath, it is of a dirty-white colour. All that of the body, but not of the membranes, has a slight ashy tinge at its roots.

The membranes are so peculiarly marked as to deserve especial

notice. They are rather ample, thin, and remarkably marked with veins, but are not papillated. The ground-colour is pale yellowish-brown, everywhere strongly marked with veins of a deep brown colour, which are faintest near the body and on the interbrachial membrane: on the interfemoral membrane they are very distinct, not very numerous, and have a transverse disposition; beneath the humerus they have a tessellated arrangement; but beneath the fore-arm they are more branched; whilst between the fingers and at the ends of the wings they are run together, and a dark-brown mottled appearance is produced. The ears and muzzle pale brown; legs, tail, and wing-bones darkish brown.

The skull is remarkable for its shortness and great depth in relation to its breadth, and for the almost total absence of ridges or crests. Although the facial line of the cranium makes a near approximation to a straight line, yet the occipital region is so high as to form a facial angle of 48 degrees*. This is due in some degree to the shape of the maxillary bones, the lower or alveolar margins of which curve upwards from the root of the zygoma to the intermaxillary bones. Some approach is made to this form of cranium by that of some of the species of *Lasiurus*, as the *L. noveboracensis*; but in that species the facial angle does not exceed 35 degrees*.

The upper incisors are four in number, very unequal in size, the outer ones being almost rudimentary. The inner ones are of moderate size, acute, and with a moderate cingulum, the outer ones very short and conical, with an evenly developed and broad cingulum. Canines rather slender and pointed. First and only premolar well developed and of the usual *carnassial* form; the three true molars of ordinary form, excepting the hinder one, which is very narrow from front to back, but has the usual number of cusps.

The lower jaw has a less prominent posterior angle than in other species of the genus, but does not otherwise differ materially. The incisors have the usual external trilobed appearance; but they are thicker from front to back than is usual, and the hinder part is produced into a kind of basal lobe, which has sufficient prominence to have the appearance of a fourth cusp. The canines are rather acute, and have the cingulum produced anteriorly into an acute point, a little above the level of the incisors. The first premolar is small, conical, and with a regular cingulum; the second somewhat similar, but considerably longer, and it is succeeded by the three true molars, of usual size and proportions, excepting the posterior one, which is rather smaller than usual.

Dentition: M. $\frac{2-2}{6}$; Can. $\frac{1-1}{1-1}$; Premol. $\frac{1-1}{2-2}$; Mol. $\frac{3-3}{3-3}=\frac{14}{18}$.

	″	‴	″	‴
Length of the head and body	2	4	2	3
——— of the head	0	8	0	9
——— of the ears	0	4	0	4
Breadth of the ears	0	4	0	4
Length of the tragus	0	$2\frac{1}{3}$	0	$2\frac{1}{2}$

* Taking the lower margin of the maxillary bone as the horizontal or base-line.

	″	‴	″	‴
Breadth of the tragus	0	1	0	1
Length of the fore-arm	1	9	1	8
——— of the thumb	0	4	0	$3\frac{3}{4}$
——— of the first finger	1	10	1	9
——— of the second finger	3	5	3	2
——— of the third finger	2	7	2	4
——— of the fourth finger	2	2	2	0
——— of the tibia	0	9	0	$8\frac{1}{2}$
——— of the foot and claws	0	$4\frac{2}{3}$	0	$4\frac{1}{2}$
——— of the tail	2	0	1	10
——— of the *os calcis*	0	9	0	9
Expanse of wings, about	13	6	12	9
Length of skull from front of intermaxillary bone to the occipital suture	0	6	0	6
Breadth behind the zygomatic arches	0	4	0	4
Length from the condyloid fossa to the front of the intermaxillary bone	0	$4\frac{1}{4}$	0	$4\frac{1}{4}$
Length of the dental series of the upper jaw, exclusive of the incisors	0	$2\frac{1}{2}$	0	$2\frac{1}{3}$
Length of the bony palate	0	2	0	$2\frac{1}{4}$
Breadth between the points of the upper canines	0	2	0	2
Breadth between the two posterior molars	0	2	0	2
Depth from the occipital suture to the bottom of the auditory bullæ	0	$4\frac{1}{2}$	0	4
Greatest length of lower jaw	0	$5\frac{1}{4}$	0	5
Breadth of lower jaw vertically from the coronoid process	0	$1\frac{3}{4}$	0	$1\frac{2}{3}$
Length of the dental series, exclusive of the incisors	0	$2\frac{3}{4}$	0	$2\frac{1}{2}$

Hab. "Otjoro, December 1st, 1859."

Obs. I have chosen to give an ample description of this species because it differs in some respects from any other species of the genus which I have seen, the differences appearing to me to be such as may (if found in any other species) be sufficient to point out another minor group, parallel with those which have been partially indicated by Blasius, and more fully by Kolenati. Broadly, these differences may be stated thus:—*Cranial portion of the skull much raised, instead of being depressed; muzzle not depressed; cutaneous system thin and elaborately veined, instead of being thick and leathery; fur long, soft, and unicoloured, and covering nearly the whole of the face.*

MINIOPTERIS SCHREIBERSII.

Vespertilio schreibersii, Kuhl, Deutsch. Fleder. 41.
V. dasythrix, Temm. Mon. ii. 268.
Miniopteris dasythrix, Smith, Zool. S. Afr. pl. 52.

Two examples of this European species were examined by me in

1855, which had recently been received from Mr. Andersson, and collected at Lake Ngama.

Molossus limbatus, Peters.

Dysopis limbatus, Peters, Reise n. Mossam. Säugeth. 56. t. 14.

With the above-mentioned specimens of *Miniopteris* were two of a species of *Molossus*, differing only from the figure and description given by Prof. Peters of his *D. limbatus* in the colour of the fur, which was without a trace of the large white abdominal mark so conspicuous in his figure. However, as the dimensions appear to accord pretty accurately, as well as the size and conformation of the cranium and the number and proportion of its teeth, I do not attach much importance to the variation in the colour of the fur, the difference in which may perhaps be attributed to age, sex, or even to season.

2. Additional Note on the Black-footed Rabbit. By A. D. Bartlett.

(Plate IV.)

On the 23rd of June 1857, at the evening meeting of this Society, I called the attention of the meeting to some Rabbits, known as the Himalayan Rabbits, and proposed provisionally to call the species *Lepus nigripes**.

Soon after my paper was published, I received a letter from a gentleman at St. Ives, informing me that this kind of rabbit could be produced by crossing the dark *wild silver-grey* rabbit with a breed known as the *Chinchilla* or light silver-grey. This at the time appeared to me strange and unlikely; nevertheless I determined to make the trial; and having during the last two or three years produced by these means a large number and fully established the fact, I beg leave to bring them before your notice.

I have here a light *silver-grey male*, a dark *silver-grey female*, and *two young* of a litter of *five*,—*two* of the number being of the Himalayan variety, the other *three* silver-greys; I have many other examples of the same thing.

Now, if the white or Himalayan varieties are removed and kept together, the result will be all Himalayan, thus showing a tendency to increase this variety at the expense of the silver-greys, because, although you may remove and destroy all the white specimens, still the silver-greys from which they originated will continue to produce white young ones, while, on the other hand, the white variety never produces silver-greys.

I mentioned in my former paper that large numbers of the skins of the white variety were imported to Europe annually, and these are probably bred in Asia. I now beg leave also to mention that for many years a large trade has been carried on by two or three mer-

* P. Z. S. 1857, p. 159.